



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,533	09/30/2005	Shen Zhao	11955/8	4330
757	7590	03/04/2008	EXAMINER	
BRINKS HOFER GILSON & LIONE			KIM, JOHN K	
P.O. BOX 10395				
CHICAGO, IL 60610			ART UNIT	PAPER NUMBER
			2834	
			MAIL DATE	DELIVERY MODE
			03/04/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,533	ZHAO, SHEN	
	Examiner	Art Unit	
	JOHN K. KIM	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 30 September 2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 September 2005 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/30/2005, 4/11/2006, 11/13/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the feature in claims 1 and 8 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

As for claim 1, the claim recites "... an electric current is supplied to the rotor coils, ..." However, means for supplying the current to the rotor coil is not shown in the drawing. Rotor is rotating, and therefore, means for supplying the current to the rotor coil must be explained to determine the functionality.

As for claim 8, the claim recites "... the rotor core has two facing surfaces respectively facing the two permanent magnets, the facing surface at the circumferential end portion of the salient pole formed in the shape of a flat-cut surface". According to the drawings, a flat-cut surface is located at edges of the permanent magnet instead of the salient pole of rotor, but no drawing shows flat_cut at end portion of the salient pole.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blaettner et al (US 5497039) in view of Muller (US 4099104).

As for claim 1, Blaettner teaches (in Figs. 1-3)

a proportional rotary torquer (20) comprising: a stator (comprising 24; col. 10, line 37) having plural permanent magnets (24); and a rotor (26) having a rotor core (28) which plural salient poles (between slots 128) are formed at, and one , or more rotor coils (125) are wound around;

wherein an electric current is supplied (via 98) to the rotor coils (125), so that a relative angle position of the rotor and the stator is displaced;

wherein the permanent magnet (24) has two circumferential end portions (102, 104 in Fig. 3B) and one circumferential center portion (100 in Fig. 3B), and the radial thickness of the circumferential end portion is from 90% to 95% of the radial thickness of the circumferential center portion; (in case of Fig. 3B design)

Blaettner, however, failed to teach or suggest wherein the distance from the radial outline of the center portion of the salient pole to the rotation center of the rotor core is not more than 99% of the distance from the radial outline of the circumferential end portion of the salient pole to the rotation center of the rotor core; and wherein the angle between the line connecting one of the circumferential outlines of the salient pole and the rotation center of the rotor core and the line connecting the other circumferential outline of the same salient pole and the rotation center of the rotor core is not less than 100 degrees.

In the same field of endeavor, Muller teaches (in Fig. 10) the distance from the radial outline of the center portion of the salient pole (52) to the rotation center (center of 39) of core (10) is not more than 99% of the distance from the radial outline of the circumferential end portion (50) of the salient pole (52) to the rotation center (center of 39) of the core (10); and

wherein the angle between the line connecting one of the circumferential outlines (50) of the salient pole (52) and the rotation center (center of 39) of the core (10) and the line connecting the other circumferential outline (51') of the same salient pole (52) and the rotation center (center of 39) of the core (10) is not less than 100 degrees.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Muller with that of Blaettner for reduction of cogging torque and enhance the efficiency.

4. As for claim 2, Blaettner and Muller teach the claimed invention as applied to claim 1 above. Claim 2 contains the same limitation as claim 1 and is rejected for the same reason set forth in connection with the rejection of claim 1 above.

5. Claims 3-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blaettner et al (US 5497039) in view of Muller (US 4099104) and in further view of Yamashita et al (US 6708388).

As for claim 3, Blaettner and Muller teach the claimed invention as applied to claim 1 above. Blaettner further teaches (in Figs. 1-2) the rotor core (28) and the permanent magnet (24) have facing surfaces facing each other. The references, however, failed to teach the facing surfaces of the rotor core and the permanent magnet (1) formed in the shapes of the circular arc surfaces of which center positions are different from each other.

In the same field of endeavor, Yamashita teaches (in Figs. 1A, 5A-B) the facing surfaces of the rotor core (31) and the permanent magnet (1) formed in the shapes of the circular arc surfaces of which center positions are different from each other. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Yamashita with that of Blaettner and Muller for reduction of cogging torque.

As for claim 4, Blaettner and Muller teach the claimed invention as applied to claim 1 above. Yamashita further teaches (in Figs. 5A-C) the permanent magnet (1) has a facing surface facing the rotor core (3), the facing surface formed in the shape of an elliptical surface.

As for claim 5, Blaettner and Muller teach the claimed invention as applied to claim 1 above. Blaettner further teaches (in Figs. 1-3) the permanent magnet (24) has a facing surface facing the rotor core (28), the facing surface at the circumferential end portion (102, 104) formed in the shape of a flat-cut surface.

As for claim 6, Blaettner and Muller teach the claimed invention as applied to claim 1 above. Muller further teaches (in Fig. 10) the rotor core (10) has two facing surfaces (52, 53) respectively facing the two permanent magnet (143), each of the facing surfaces of the rotor core (10) formed in the shapes of a plurality of circular arc surfaces (at 50, 50', 51, 51' and center of 52) of which center positions are different from each other. Muller, however, failed to teach the two permanent magnets as it is a ring magnet with two magnetic poles. Blaettner, however, teaches (in Fig. 1) two permanent magnets (24). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Blaettner with that of Muller for manufacturing easiness of the magnet by using segment magnets.

As for claim 7, Blaettner and Muller teach the claimed invention as applied to claim 1 above. Muller teaches (in Fig. 10) the core (10) has two facing surfaces (52, 53) respectively facing the two permanent magnets (143), each of the facing surfaces formed in the shape of an elliptical surface. Muller failed to teach the core is rotor core, but Blaettner teaches (in Fig. 1) core (28) is a rotor core. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Blaettner with that of Muller for DC operative machine.

As for claim 9, Blaettner and Muller teach the claimed invention as applied to claim 1 above. Muller further teaches (Fig. 10) the permanent magnet has two circumferential end portions (176, 177), each of which has a non-magnetized region formed thereat. (col. 7, line 38)

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blaettner et al (US 5497039) in view of Muller (US 4099104) and in further view of Nitta et al (JP 09-163708, English machine translated).

Blaettner and Muller teach the claimed invention as applied to claim 1 above. Muller teaches the rotor core (10) has two facing surfaces respectively facing the two-permanent magnet (143). However, Muller failed to teach the two permanent magnets, but Blaettner teaches two permanent magnets. The references, however, failed to teach the rotor core has the facing surface at the circumferential end portion of the salient pole formed in the shape of a flat-cut surface.

In the same field of endeavor, Nitta teaches (in Fig. 1) the core (12) has the facing surface at the circumferential end portion of the salient pole (12a) formed in the shape of a flat-cut surface. (at both edges of 12a) Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Nita with that of Blaettner and Muller for easiness of core stamping by avoiding acute angle.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blaettner et al (US 5497039) in view of Muller (US 4099104) and in further view of Guttinger (US 4296341).

Blaettner and Muller teach the claimed invention as applied to claim 1 above. However, the reference failed to teach the proportional rotary torquer further comprises one or more elastic members generating the torque at the magnitude proportional to the angular displacement of the rotor and in the direction opposite to the rotation direction of the rotor.

In the same field of endeavor, Guttinger teaches (in Fig. 1) the proportional rotary torquer further comprises one or more elastic members (18) generating the torque at the magnitude proportional to the angular displacement of the rotor and in the direction opposite to the rotation direction of the rotor. (col. 3, line 30-39) Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Guttinger with that of Blaettner and Muller for damping of the rotor motion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN K. KIM whose telephone number is (571)270-5072. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JK

/Darren Schuberg/
Supervisory Patent Examiner, Art Unit 2834